

**DUST COLLECTION ARRANGEMENT FOR A MITER SAW**

[0001] This application claims the benefit of U.S. Provisional Application No. 60/409,772, filed September 11, 2002, now pending.

**Field of the Invention**

5        [0002] This invention relates generally to miter saws and in particular to dust collection arrangements for miter saws.

**Background of the Invention**

10       [0003] Referring to FIG. 1, non-sliding and slide miter saws both have a base 11, a rotatable table 12 attached to the base 11, a saw assembly 20 including a motor 21, a blade 22 driven by the motor 21, a cover housing (not shown) covering motor 21, an upper blade guard 24 covering the upper part of blade 22, and a lower guard 25 (shown in broken lines) pivotably attached to upper blade guard 24 for covering the lower part of blade 21. Accordingly, the saw assembly 20 is pivoted downwardly for cutting a  
15       workpiece disposed on the base 11 and table 12.

20       [0004] In addition, slide miter saws enable the user to move the saw assembly horizontally along the table. Most slide miter saws accomplish this by connecting the upper blade guard 24 (and thus the saw assembly 20) to a pivot arm 26, which in turn is connected to a trunnion 13, which is fixedly connected to at least one rail 14, which is slidably attached to a support housing 15 connected to the table 12 (see, e.g., US Patent No. 6,067,885). With such arrangement, the user would pull the saw assembly 20 forwardly, move the saw assembly 20 downwardly, then push the saw assembly 20 rearwardly for cutting a workpiece W.

[0005] The miter saw may also have a movable fence assembly 30 attached to the base 11. Movable fence assembly 30 may extend laterally across table 12, against which workpiece W can be positioned and supported for performing the cutting operation thereon. Movable fence assembly 30 typically include a fixed fence 31 attached to base 11, and a movable fence 32 connected to the fixed fence 21. Usually, movable fence 32 is slidably attached to fixed fence 31. Persons skilled in the art are referred to US Patent Nos. 5,297,463 and 5,943,931, which are wholly incorporated by reference herein.

[0006] Some miter saws include dust collection flaps 27 for directing the dust resulting from the cutting operation through pivot arm 26 and/or upper blade guard 24, which then exits through dust port 27. Some typical dust collection flaps 27 are made of rubber or other resilient materials.

[0007] Due to their design, dust collection flaps 27 typically contact lower blade guard 25 when the saw assembly 20 is in the non-cutting position. Sometimes, however, this contact partly exposes the outer circumference of blade 22. This situation could violate some European regulations.

#### Summary of the Invention

[0008] In accordance with the present invention, an improved miter saw is employed. The miter saw includes a base, a table rotatably attached to the base, a support housing connected to the table, a saw assembly connected to the support housing, the saw assembly comprising a pivot arm, an upper blade guard connected to the pivot arm, a motor attached to the upper blade guard, and a blade driven by the motor, and a dust collector having a main body, wherein at least one slot is disposed on the main body.

[0009] Additional features and benefits of the present invention are described, and will be apparent from, the accompanying drawings and the detailed description below.

#### Brief Description of the Drawings

5        [0010] The accompanying drawings illustrate preferred embodiments of the invention according to the practical application of the principles thereof, and in which:

[0011] FIG. 1 is a side view of a typical prior art slide miter saw;

[0012] FIG. 2 is a partial side view of a saw assembly according to the invention;

10       [0013] FIG. 3 illustrates a first embodiment of a dust collector according to the invention, where FIG. 3A is a front view of the dust collector along line III-III of FIG. 2 and FIG. 3B is a side view of the dust collector in a bent position;

[0014] FIG. 4 illustrates a second embodiment of a dust collector according to the invention, where FIGS. 4A-4B are side views of the dust collector with the lower blade guard in non-contacting and contacting positions, respectively;

15       [0015] FIG. 5 is a partial cross-sectional view along line V-V of FIG. 2; and

[0016] FIG. 6 is a partial perspective view of the arrangement shown in FIG. 5.

#### Detailed Description

[0017] The invention is now described with reference to the accompanying figures, wherein like numerals designate like parts. Referring to FIGS. 1-2, a slide miter saw 10 preferably has a base 11, a table 12 rotatably connected to the base 11, a support housing 15 pivotally connected to table 12, at least one (and preferably two) rail(s) 14 slidably connected to the support housing 15, and a saw assembly which comprises a trunnion 13

attached to one end of the rail(s) 14, a pivot arm 26 pivotably attached to trunnion 13, a motor 21, a blade 22 driven by the motor 21, an upper blade guard 24 for covering an upper part of blade 22, and a lower blade 25 pivotally attached to the upper blade guard 24 for covering a lower part of blade 22. Preferably the motor 21 is attached to the upper  
5 blade guard 24. These elements are well known in the art. Persons skilled in the art are referred to US Patent No. 6,067,885, which is wholly incorporated by reference herein.

[0018] Referring to FIGS. 2-3, a dust collector assembly 40 may be attached to the upper blade guard 24 and/or pivot arm 26 for directing the dust resulting from the cutting operation through pivot arm 26 and/or upper blade guard 24. The dust preferably then  
10 exits through dust port 27. Dust collector assembly 40 may be made of rubber or any other resilient material.

[0019] A first embodiment of dust collector assembly 40 is shown in FIG. 3. Dust collector assembly 40 may have a main body 41, side walls 43, and a lower portion 42. Dust collector assembly may also have at least one slot 44 extending from main body 41  
15 to the outer edge of dust collector assembly 40. Persons skilled in the art shall recognize that slots 44 are preferably through slots. In other words, the slots 44 preferably extend between opposing faces of dust collector assembly 40.

[0020] Preferably the slots 44 are disposed between the side walls 43 and the lower portion 42 to allow lower portion 42 to fold either forwardly or rearwardly (as shown in  
20 FIG. 3B) when passing over an obstruction, a workpiece, etc.

[0021] Persons skilled in the art should recognize that slots 44 may be disposed anywhere on dust collector assembly 40. It is however preferable to not place the slots in

the middle (or vertical centerline) of main body 41 as some dust may escape through the slots. However, such placement is still within the scope of the present invention.

[0022] Providing at least one slot 44 may also allow different parts of dust collector assembly 40 to move relative to each other when compressed by the lower blade guard 25, so that it does not partly expose the outer circumference of blade 22.

[0023] Another embodiment of dust collector assembly 40 is shown in FIG. 4. The teachings of the previous embodiment are wholly incorporated herein. As before, dust collector assembly 40 has a body 45 with at least one slot 46 disposed thereon. The main difference between the two embodiments is that slot(s) 46, unlike slot 44, do(es) not reach the outer edge of body 45. Nevertheless, providing at least one slot 46 allows different parts of dust collector assembly 40 to move relative to each other when compressed by the lower blade guard 25, so that it does not partly expose the outer circumference of blade 22, as shown in FIG. 4 and more specifically in FIG. 4B.

[0024] Again, persons skilled in the art shall recognize that slots 46 are preferably through slots. In other words, the slots 46 preferably extend between opposing faces of dust collector assembly 40.

[0025] The upper blade guard 24 may incorporate another feature to assist in the collection of dust. Referring to FIGS. 2 and 5-6, upper blade guard 24 may have a shaft support 24S for supporting a shaft 21S which may be driven by motor 21 and/or supports blade 22. Upper blade guard 24 may also support a motor housing 28 which encloses motor 21.

[0026] Upper blade guard 24 may have a rib 24R for limiting the amount of dust entering upper blade guard 24. Preferably, rib 24R is substantially perpendicular to the

plane defined by blade 22. In addition, a plane defined by rib 24R may intersect the axis of rotation of shaft 21S and/or blade 22. Accordingly, rib 24R may prevent some dust or wood chips from entering the upper blade guard 24.

[0027] Rib 24R may also preferably shaped so that it affects the airflow within upper  
5 blade guard 24. Preferably, rib 24 is substantially flat. By placing it as described above, it would help direct the dust or wood chips that entered into the upper blade guard 24 towards dust port 27.

[0028] Persons skilled in the art shall recognize that shaft support 24S and rib 24R may be separable from or integrally build into upper blade guard 24. In addition, persons skilled  
10 in the art should recognize that shaft support 24S and rib 24R may be built integrally together.

[0029] Persons skilled in the art may recognize other additions or alternatives to the means disclosed herein. However, all these additions and/or alterations are considered to be equivalents of the present invention.

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